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TROP PRUNER & HU, PC 8554 KATY FREEWAY SUITE 100 HOUSTON, TX 77024			TRAN, THANH Y	
			ART UNIT	PAPER NUMBER
			2827	

DATE MAILED: 11/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/811,063

Applicant(s)

JOE A. HARRISON

Examiner

Thanh Y. Tran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-41 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31-38 is/are allowed.
- 6) ☒ Claim(s) 1-6, 8 and 10-41 is/are rejected.
- 7) ☒ Claim(s) 9 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harwer et al (U.S. 5,440,755) in view of Woychik (U.S. 5,629,839).

As to claim 1, Harwer et al discloses a circuit board (Fig. 2b) comprising a substrate; and electrical contacts (44, 42) to mate with a slot connector (28, 30, Fig. 2d), the contacts (44, 42) comprising a first set (44) of at least three uniformly spaced contacts and a second set (42) of at least three uniformly spaced contacts to communicate signals and not to communicate power (see col. 4, lines 15-20); adjacent contacts of the first set (44) being separated by a first distance (see Figs. 2a-2c) and adjacent contacts of the second set (42) being separated by a second distance different from the first distance.

Harwer et al. does not teach a first set of at least three uniformly spaced contacts to communicate power. Woychik teaches a substrate (Fig. 8) comprising a first set (152) of contacts to communicate power (see col. 8, lines 1-15). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the first set of at least three uniformly spaced contacts of Harwer by using power contacts (power leads) as taught by Woychik for carrying power to circuitry of the substrate.

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As to claim 2, figures 2a-2b of Harwer show that the first distance is *approximately* half of the second distance.

As to claim 3, figure 1 and 2d of Harwer show that the substrate (40) comprises an edge to be inserted into a slot connector housing (28, 30), and the first and second set of contacts (44, 42) are formed on the edge.

As to claim 4, Harwer is silent teaching the substrate wherein the first distance is approximately 0.05 inches and the second distance establishes a pitch of approximately 0.10 inches. However, it would have been obvious to one having ordinary skill in the art at the time of the invention was made to modify the circuit board of Harwer to include a specific first distance of approximately 0.05 inches, and a second distance of approximately 0.10 inches for the purpose of intended use, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

As to claim 5, the same reasoning applies to claim 5 as discussed in the rejection claim 1 regarding the power line (power regulation circuitry) which regulates voltage provided by the first set of contacts.

3. Claims 6, 10-12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harwer et al (U.S. 5,440,755) in view of Daskalakis et al (U.S. 6,551,120).

As to claim 6, Harwer a circuit board (Fig. 1) comprises circuitry; and a substrate (40) supporting the circuitry and having a contact edge to be inserted into a slot connector housing assembly (28, 30).

Harwer does not teach the substrate having an edge profile engaged by the connector housing assembly to resist removal of the circuit board from the connector housing assembly. However, Daskalakis et al teaches a circuit board (circuit card 50, Fig. 3) having an edge profile/hook (comprising elements 12, 51) engaged by the connector housing assembly (61) inside the slot connector housing assembly (see Fig. 3, col. 4, lines 40-65) to resist removal of the circuit board (50) from the connector housing assembly (61). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the substrate of Harwer by adding an edge profile/hook as taught by Daskalakis et al for securing the substrate/circuit card within the connector housing assembly.

As to claim 10, figure 1 of Harwer et al shows that the straight edge extends in an orthogonal direction to the contact.

Claims 11-12, and 14 recite method steps which are inherently performed during the making of product claims 6 and 10.

4. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dell et al. (U.S. 6,097,883) in view of Pope et al (U.S. 6,135,781).

As to claim 15, Dell et al. discloses a connector (Fig. 8, element 52) comprising: a housing (54) including a slot (56) to receive a circuit board (10), the housing (54); and electrical contacts secured to the housing (54) to establish electrical communication with electrical contact pads (18, 20) of the circuit board (10) (see Fig. 8, col. 6, lines 1-25).

Dell et al. is silent teaching the housing being formed from a material having a thermal conductivity of at least approximately 0.27 W/m-K. However, it would have been obvious to a

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person having ordinary skill in the art at the time the invention was made to provide a housing which is formed from a material (liquid crystal polymer such as Zenite) having a thermal conductivity of at least approximately 0.27 W/m-K in the prior art of Dell et al.. Pope et al. teaches a housing (connector) comprising a material of Zenite (see col. 57, lines 1-21).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the prior art of Dell et al. by using a material of Zenite (which is inherently having the same thermal conductivity and *approximately* 0.27 W/m-K) for making the connector housing as taught by Pope et al.. Because such modification would prevent the disadvantage of high thermal conductivity which may damage to the circuitry of circuit board.

As to claim 16, Dell et al. discloses the material of connector comprises a liquid crystal polymer (plastic) (see col. 6, lines 1-15).

5. Claims 18-19, and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dell et al. (U.S. 6,097,883) in view of Pope et al (U.S. 6,135,781) as applied to claim 15 above, and further in view of Daskalakis et al (U.S. 6,551,120).

Claim 25 recites limitations similar to claim 15. Dell et al teaches a slot connector (Fig. 8, element 52) comprising a retention mechanism (58) to engage the circuit board (10) to secure the circuit board (10) to the slot connector (56). Dell et al and Pope et al do not teach the substrate comprising a retention mechanism to engage an edge profile of circuit board.

However, Daskalakis et al teaches a circuit board (50, Fig. 3) comprising a profile (comprising elements 12, 51), the same reasoning applies to claim 25 regarding the limitation of a circuit

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board comprising a profile engaged by the connector housing assembly inside the slot connector housing assembly as discussed above in claim 6.

As to claim 26, figure 8 of Dell et al shows the retention mechanism (58) is located entirely inside the slot (56).

As to claim 27, figure 8 of Dell et al shows the retention mechanism (58) comprises a spring (see col. 6, lines 1-5).

Claims 28-30 recite method steps are inherently performed during the making of product claims 25-27.

Claims 18-19 recite method steps which are inherently performed during the making of product claims 15 and 16.

6. Claims 17, and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dell et al. (U.S. 6,097,883) in view of Pope et al (U.S. 6,135,781) as applied above in claim 15 and further in view of Volz et al. (U.S. 5,353,191).

As to claim 17, Dell et al and Pope et al do not teach the housing (connector) comprising fins to promote conduction of heat away from the circuit board. Volz et al teaches a housing (10, Fig. 1) comprising fins (20) to promote conduction of heat away from the circuit board (see col. 3, line 60 - col. 4, line 16). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the housing of Dell et al and Pope et al by including fins as taught by Volz et al for the purpose of providing good heat dissipation from circuit board.

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Claims 21, 22, and 24 recite method steps are inherently performed during the making of product claims 15-17.

Claim 20 recites method steps which are inherently performed during the making of product claims 17.

Claim 23 recites a specific range of $\frac{1}{4}$ and $\frac{3}{8}$ inches of each of the clearances. The same reasoning applies to claim 23, as discussed above in claim 4 regarding the optimum value.

7. Claims 8 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Harwer et al (U.S. 5,440,755) in view of Daskalakis et al (U.S. 6,551,120) as applied above in claim 6, and further in view of Dell et al. (U.S. 6,097,883).

As to claim 8, Harwer and Daskalakis et al do not teach that mechanism comprises at least one of a spring located entirely inside the connector housing and a plastic latch internal to the connector housing. Dell et al discloses a circuit board (Fig. 8, element 10) wherein the mechanism (52) comprises at least one of a spring (58) located entirely inside the connector housing and a plastic latch internal to the connector housing (see col. 6, lines 1-15). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to include a plastic socket comprising at least one of a spring as taught by Dell et al, in the prior art of Harwer and Daskalakis et al for holding the substrate within the slot connector housing assembly securely.

Claim 13 recites method steps which are inherently performed during the making of product claim 8.

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8. Claims 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Villemont et al (U.S. 4,382,271).

With respect to claim 39, Villemont et al discloses a housing (comprising elements 17, 19 and 23, Fig. 1b) to form a slot to receive a circuit board (10); and film (15) thermally coupled to the housing to conduct heat away from circuitry of the circuit board (10) (see Fig. 1b, col. 3, lines 5-20). Villemont et al discloses the claimed invention except for a plurality of films thermally coupled to the housing. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to provide another film thermally coupled to the housing in the prior art of Villemont et al, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

With respect to claim 40, Villemont et al does not teach a plurality of films thermally coupled to the housing and the film is formed out of a liquid crystal polymer. The same reasoning applies to claim 40 regarding a plurality of films thermally coupled to the housing as discussed above in claim 39. The Examiner also takes Official Notice that it is known to choose a material of liquid crystal polymer for making of a thermal conductive film. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the reference of Villemont et al by using a material of liquid crystal polymer for making of a thermal conductive film for the providing high thermal conductivity, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

9. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Villemont et al (U.S. 4,382,271) in view of Daskalakis et al (U.S. 6,551,120).

With respect to claim 41, Villemont et al does not teach a retention mechanism located at least partially inside the housing to engage the circuit board to resist removal of the circuit board from a housing. Daskalakis et al teaches a circuit board (circuit card 50, Fig. 3) having a retention mechanism (comprising elements 12, 51) located at least partially inside the housing (61) to engage the circuit board (50) to resist removal of the circuit board from the housing (see Fig. 3, col. 4, lines 40-65). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the substrate of Harwer by adding a retention mechanism as taught by Daskalakis et al for securing the substrate (circuit card) within housing.

Allowable Subject Matter

10. Claim 9 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. Claims 31-38 are allowed.

The following is an examiner's statement of reasons for allowance: In claims 31 and 35, the patentability is a combination of: A circuit board comprising a circuitry; and a substrate supporting the circuitry and having a contact edge to be inserted into a slot connector housing assembly, the substrate having an edge profile engaged by the connector housing assembly to

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resist removal of the circuit board from the connector housing assembly, wherein the profile comprises a notch formed in a straight edge of the substrate, the straight edge being different from the contact edge and being inserted into the slot connector housing to position the edge profile to engage the connector housing assembly.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments with respect to claims 6, 8-14, 28-30 and 39-41 have been considered but are moot in view of the new ground(s) of rejection.

Claims 1-5 and 15-27 are maintained with the same rejection, except for amended claims 6, 8-14 and 28-30, and new claims 39-41 are moot in view of the new ground(s) of rejection.

With respect to claims 1-5, Applicant argues that the Examiner fails to show where the prior art allegedly teaches a circuit board that includes uniformly spaced contacts to communicate power that are separated by a first distance and uniformly spaced contacts to communicate signals and not communicate power that are separated by a second different distance. The Examiner disagrees because Harver et al clearly teach a circuit board (see Fig. 2b) comprising a substrate including uniformly spaced contacts (44) that are separated by a first distance, and uniformly spaced contacts (42) to communicate signals and not communicate power that are separated by a second different distance (see Fig. 2b, col. 4, lines 15-20). Harver

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et al does not teach that uniformly spaced contacts (44) to communicate power. However, Woychik teaches a substrate (see Fig. 8) comprising contacts (152) can be dedicated for power leads or communicated to power (power lead) (see col. 8, lines 1-15). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify the first set of at least three uniformly spaced contacts of Harwer to communicate power as taught by Woychik for carrying power to circuitry of the substrate.

With respect to claims 15-20, Applicant states that all claim limitations must be taught or suggested by the prior art, however, the combination of references (Dell et al and Pope et al teach all claim limitations as cited in claim 15 as discussed above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

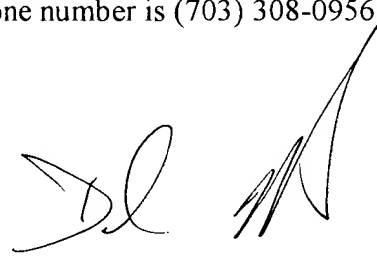
Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Y. Tran whose telephone number is (703) 305-4757. The examiner can normally be reached on Monday through Thursday and on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin, can be reached on (703) 308-3121. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3431.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

TYT



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